

REMARKS

All pending claims have been rejected under 35 USC §102 in view of Naik. Claims 6, 19, 34 and 49 are independent claims. Reconsideration of the rejection is respectfully requested, it is believed that the Examiner has misconstrued applicable portions of the Naik reference.

The Office Action asserts that the Applicant's prior arguments were premised upon Naik not teaching a positive mask scheme. [Final Office Action p. 8] It is respectfully asserted that the Action has misunderstood Applicant's arguments.

In particular, it is noted that Applicants arguments expressly relied upon Naik teaching a positive mask scheme. However, it is asserted that to construe what Naik teaches for a positive mask scheme one must view the figures and disclosure of Naik as essentially the opposite of what is shown. In particular the previous response noted:

It is agreed that Naik teaches the use of positive masks schemes, however, it is respectfully submitted that Figures 4A-4J of Naik are shown in a negative mask scheme (note the non-exposed region 424 of the photo layer 408 is removed). [Naik, page 5, paragraph 55]. It is noted later in Naik that the structure of Figures 4A-4J can be formed in a positive mask: **"The same structure may also be formed using a positive tone development process. This process would employ a mask structure essentially the opposite to that of the negative tone process..."** [Naik, page 6, paragraph 59 (emphasis added)].

Importantly, when construing the disclosure of Naik for a positive mask scheme one must construe the disclosure in an opposite manner. It was the position in the prior response that by making such an inversion the claimed elements of the present application are not disclosed or taught.

With this clarification, it is hopeful that the prior remarks will be more fully understood. As such the prior remarks have been repeated below.

The Final Office Action also asserts that Naik teaches a “further” exposure “after the mask scheme. [Final Office Action, p. 9] In particular the Office Action notes the disclosure of Naik p. 5, paragraphs 0053-0057.

Such portions of Naik are provided in reference to Figure 4. As noted with regard to paragraph 0053 and Figure 4E of Naik, a bilevel mask structure can be utilized with a single exposure or two single mask steps may be utilized back to back with two separate exposures.

However, it is respectfully asserted that even if two exposures are utilized such exposures are part of the same mask scheme to form the masking structure. It is noted that there is no other exposures after the masking scheme step of Figure 4E.

To help clarify this distinction claim 6 has been amended to more clearly reflect that a scheme such as Naik does not disclose further exposure after the masking exposure(s).

It is respectfully asserted that each independent claim is patentably distinct from the cited references.

Prior Remarks Filed 9/21/05

Independent Claim 6 (with the March 3, 2006 Amendment added)

Claim 6 includes the limitation (bold added for emphasis):

at least one feature formed on said substrate by converting selected portions of a photo-definable layer to an insulative material **through exposure to electro-magnetic radiation in a positive mask scheme...**

an insulative layer formed on said substrate **from said non-exposed portions** of said photo-definable layer **which remain after** the positive mask scheme completes all

masking steps that form the at least one feature and **are then** subsequently converted to the insulative layer **through exposure to further electro-magnetic radiation.**

The Office Action relies upon the disclosure of Figure 4A-4J of Naik (Figure 4E in particular) for the rejection of independent claim 1. Further, the Office Action notes that Naik discloses that the technique of Naik can be used in positive mask schemes. It is agreed that Naik teaches the use of positive masks schemes, however, it is respectfully submitted that Figures 4A-4J of Naik are shown in a negative mask scheme (note the non-exposed region 424 of the photo layer 408 is removed). [Naik, page 5, paragraph 55]. It is noted later in Naik that the structure of Figures 4A-4J can be formed in a positive mask: “The same structure may also be formed using a positive tone development process. **This process would employ a mask structure essentially the opposite to that of the negative tone process...**” [Naik, page 6, paragraph 59 (emphasis added)].

It is respectfully submitted that the Office Action has improperly used the negative tone scheme shown in Naik Figure 4E to find the claimed elements in claim 1 relating to exposed and non-exposed regions of the claimed positive masking. To attempt to use the disclosure of Naik and Figure 4E to read upon the positive mask claimed elements one would have to construe Figure 4E with the mask structure and exposed regions “essentially the opposite” as that shown in Figure 4E. It is respectfully submitted that the teaching of Naik does not disclose the claimed elements.

Further it is noted that the claim requires an insulative layer to be formed from non-exposed portions of the photo definable layer **which remain after the mask scheme and are then** converted to an insulative layer by **further electro-magnetic radiation.** Thus, after the masking scheme is accomplished further radiation is used to convert the non-exposed portions to an insulator. Thus two radiation exposures are called out. The Final Office Action points to Figure 4E of Naik. (Final Office Action, p. 7). However, Figure 4E of Naik is the original masking scheme and there is no “further” exposure “after the mask scheme.” Naik utilizes only a

single exposure process. Moreover, the non-exposed portion (424) of Naik is never converted to an insulator.

It is therefore respectfully asserted that the claimed elements of claim 1 (and all claims that depend therefrom) are missing from Naik.

Independent Claim 19

It is respectfully noted that similar to independent claim 1, claim 19 is directed towards “a positive mask scheme” and that it is asserted that the use of the negative mask scheme of Figure 4A-4J of Naik is similarly improper with regard to claim 19 without changing the masking scheme of Figure 4A-4J to essentially the opposite scheme.

In addition, it is noted that claim 19 includes the limitation (emphasis in bold added): “wherein said insulative layer comprises an oxide layer and the non-exposed portions of **said photo-definable layer are utilized to mask the oxide layer to form said patterned insulative layer.**”

The Office Action states that non-exposed portions 424 of the photo-definable layer 408 are utilized to mask the oxide layer to form the patterned insulative layer citing Figures 4E. (Final Office Action, p. 4).

It is respectfully noted the only possible oxide layer of Figures 4A-4J is layer 404 (defined in Paragraph 0054 of Naik as an etch stop of silicon dioxide or silicon nitride). Layer 406 is not an oxide but rather a low K dielectric (Naik notes that low K dielectrics are organic or carbon based layers, Paragraph 0008). The photo-definable layer 408 masks the low K dielectric layer 406 as shown in Figures 4F-4G of Naik not the oxide layer 404. Furthermore, the non-exposed portion 424 of layer 408 does not mask anything as it is removed as shown in Figure 4F of Naik. Rather, it is the low K dielectric layer 406 that operates as the mask of the oxide layer 404 as shown in Figures 4G-4H.

Thus, it is respectfully asserted that the non-exposed portions of layer 408 are not utilized to mask the oxide layer to form the patterned insulative layer. It is therefore respectfully asserted that the claimed elements of claim 19 (and all claims that depend therefrom) are missing from Naik.

Independent Claim 34

It is respectfully noted that similar to independent claim 1, claim 34 is directed towards “a positive mask scheme” and that it is asserted that the use of the negative mask schemes of Naik is similarly improper with regard to claim 34 without changing the masking schemes of Naik to “essentially the opposite” scheme.

Further, it is respectfully asserted that the Office Action had misconstrued an insulative layer in Naik as a conductive layer. In particular, the Office Action states that layers 302 and 324 are both a “conductive layer”. [Office Action, p. 5] It is respectfully noted that layers 302, 312, 314, and 324 are all insulative layers however. In particular layer 302 is a low K material [Naik paragraph 0044], layer 312 is a copper passivation layer “for example silicon nitride” [Naik paragraph 0048], layer 314 is a second low K material [Naik paragraph 0049] and layer 324 is a second copper passivation layer [Naik paragraph 0049].

It is therefore respectfully asserted that the claimed elements of claim 34 (and all claims that depend therefrom) are missing from Naik.

Independent Claim 49

It is respectfully noted that similar to independent claim 1, claim 49 is directed towards “a positive mask scheme” and that it is asserted that the use of the negative mask schemes of Naik is

similarly improper with regard to claim 49 without changing the masking schemes of Naik to “essentially the opposite” scheme.

Moreover, independent claim 49 is directed toward a claimed embodiment which includes the use of both a photodefinable layer that can be converted to an insulative material (for example a PPMS layer than can be converted to an insulative material) in combination with the use of a separate organic photoresist layer. More particularly, claim 49 includes: “an insulative layer on said substrate formed by **covering a photo-definable layer with a separate patterned organic photoresist...**” In the Office Action, the cited photo-definable layer of Naik is PPMS layer 408 of Figures 4A-4J. However, **there is no other layer in Naik that covers layer 408**, let alone the use of a separate patterned organic photoresist covering layer 408.

It is therefore respectfully asserted that the claimed elements of claim 49 (and all claims that depend therefrom) are missing from Naik.

CONCLUSION

In view of the foregoing, it is submitted that the claims are in condition for allowance. Accordingly, favorable reconsideration and Notice of Allowance are courteously solicited.

The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Should any fees under 37 CFR 1.16-1.21 be required for any reason relating to the enclosed materials, including any additional fee for an extension of time, the Commissioner is authorized to deduct such fees from O'Keefe, Egan & Peterman Deposit Account No. 10-1205/MTIP:003D1.

Respectfully submitted,



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